Halls Gap Landslide Interim Guidelines

26 May 2011

Prepared by the Halls Gap Community Safety Committee

Committee Executive Summary

The Halls Gap Community Safety Committee has developed Interim Guidelines to provide information to the Municipal Emergency Management Planning Committee and the Halls Gap community on the management of landslides in and around Halls Gap area. The Northern Grampians Shire Council endorsed a report at their February 2011 Ordinary council meeting that recommended using the Halls Gap Community Safety Committee to prepare Interim Guidelines for the management of landslides in Halls Gap area.

The Interim Guidelines will be superseded in time by a Grampians Landslide Contingency Plan (GLCP). The GLCP will be prepared by a Steering Committee and Reference Group appointed by the Northern Grampians Shire Council Municipal Emergency Management Committee.

The Halls Gap Community Safety Committee strongly encourage all residents, business owners and visitors to the Halls Gap area to read the interim Guidelines and make themselves familiar with emergency management preparedness and responses.

Alfred Mason
Chair
Halls Gap Community Safety Committee

HALLS GAP COMMUNITY SAFETY COMMITTEE

The Halls Gap Community Safety Committee was established in the early 2000s. It provides local advice and expertise on Halls Gap area and its community to key emergency management agencies. The Committee was instrumental in developing the annual community cleanup program to reduce fire hazards in the Halls Gap area. The committee has also provided advice on the Halls Gap flood plan which is a sub plan of the Northern Grampians Shire Council (NGSC) Municipal Emergency Management Plan (MEMP).

The membership representation is dynamic and may change in accordance with the issues at hand. For the purposes of the landslide contingency planning, additional representatives from the agencies have been co-opted. The Halls Gap Community Safety Committee currently comprises representatives from the following agencies:

- The Department of Sustainability and Environment
- Parks Victoria
- Country Fire Authority
- Victoria Police (Halls Gap)
- State Emergency Service
- Northern Grampians Shire Council
- Community representatives

BACKGROUND

These interim guidelines have been prepared to provide advice to the Municipal Emergency Management Planning Committee and the Halls Gap community. They have been developed primarily for the township of Halls Gap as outlined in Figure 1 on page 4. The document will be presented to the Municipal Emergency Management Planning Committee for endorsement. The committee has prepared a Rainfall Threshold Indicators table based on advice provided by GHD and A.S. Miner Geotechnical Consultants. Refer to Appendix 1.

The Halls Gap area and surrounds received approximately 270mm of rainfall over a 48 hour period during January 2011. This rainfall event in Halls Gap created flooding within the township and significant landslides across the Grampians National Park. Over 190 landslides were recorded in the week immediately after the January floods with further landslides now being identified as works begin on restoration of assets and infrastructure.

Within Halls Gap landslides impacted on public and private assets in the Pinnacle Rd area, with many other areas of the township impacted from debris and sediments that had become mobile in water driven landslides. The most visibly affected area was the Stony Creek precinct; however impacts have been felt from Pinnacle Rd through to Mt Zero Rd.

On 4 February 2011 State Emergency Services (SES), as the lead agency for storm and flood emergencies, made a decision to evacuate part of the township of Halls Gap based on forecast thunderstorms and heavy rain, and the risks to community safety due to potential landslides on the west side of Grampians Rd between Pinnacle Rd and Mackeys Peak Rd. The decision by SES was also influenced by geotechnical advice received from consultants GHD Pty Ltd which identified slope stability hazards in the Wonderland Range on the west side of the Halls Gap township.[1]

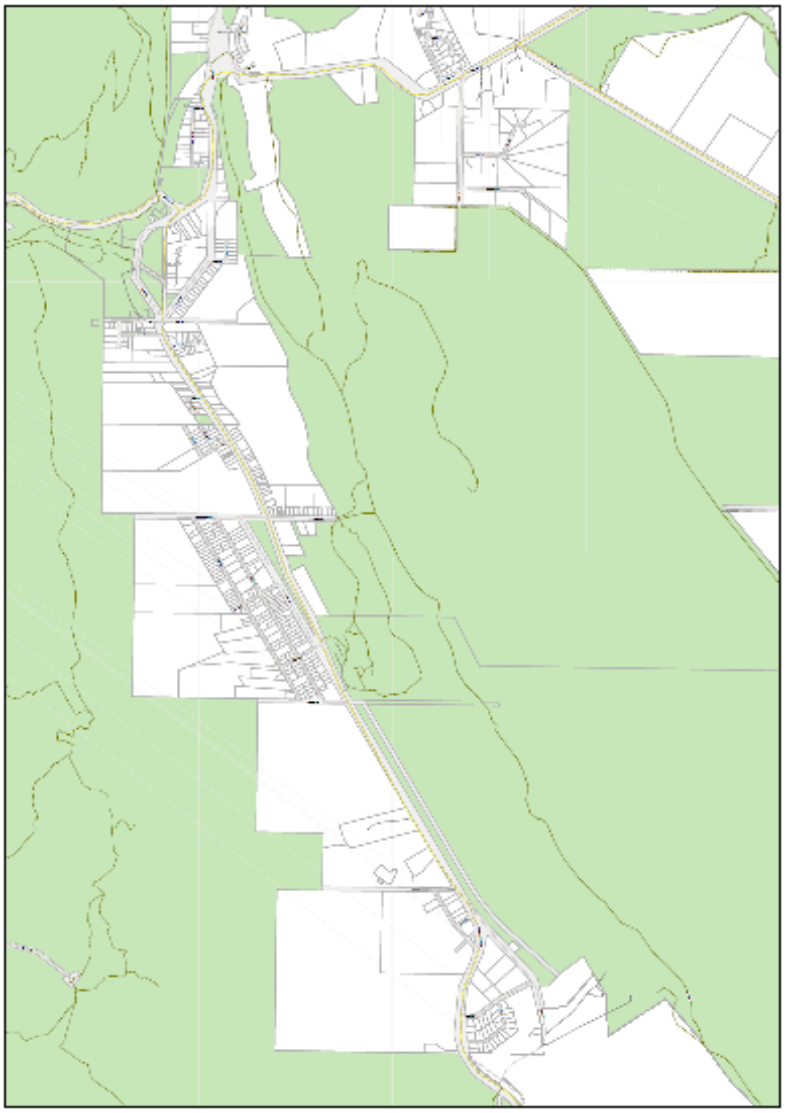
[1] Source: GHD Hazard Summary for Rainfall Induced Landslides in Halls Gap – 07 Feb 2011

During March 2011 the NGSC was requested to have their Municipal Emergency Coordination Centre (MECC) on standby due to predicted heavy rainfall with the possibility of imbedded thunderstorms. The notification for the predicted rain event was received during a meeting of the Halls Gap Community Safety Committee in Halls Gap. The Committee made contact with the Halls Gap school to provide advice and notification was sent to the email contact lists for business and residents in Halls Gap. Whilst the predicted rainfall had no impact on Halls Gap it highlighted the community's concerns around the uncertainties associated with rainfall (predicted or actual) driven landslides.

There is ongoing concern being expressed by the Halls Gap community around the risks associated with rainfall events whether predicted or actual. The interim guidelines will be communicated to the Halls Gap community to provide information on the triggers that will be considered by key agencies in relation to landslides.

The March 2011 event had a significant impact upon the Halls Gap business community and residents alike.

Figure 1. Area relevant to the Halls Gap Landslide Interim Guidelines



KEY ISSUES

1. Access and Egress

The January 2011 floods have severely impacted the road infrastructure around Halls Gap area. VicRoads, NGSC and Parks Victoria roads have all been impacted by the floods. The VicRoads roads within the immediate vicinity of Halls Gap require considerable works to repair the damage. Some road blocks that were established during the January 2011 floods are still in place and some roads will remain closed for up to 12 months.

The road closures present additional challenges for the management of emergencies in Halls Gap. The main road running south through Halls Gap to Dunkeld remains closed along with the Mt Victory Rd which provides a link to Horsham in the west. Access and egress to the Halls Gap township is restricted to Grampians Rd. Delley's bridge provides a critical link to Halls Gap across Fyans Creek.

The restricted access and egress to Halls Gap will be taken into account by emergency agencies when making decisions associated with community safety.

Interim Control Action

VicPolice have prepared traffic management plans to be used in response to an emergency and to assist with any proposed evacuation.

2. Utility Providers

Halls Gap is serviced by the following utility providers:

- Powercor – electricity
- Grampians Wimmera Mallee Water Authority – potable water and sewerage
- Telstra and Optus – telecommunications

Utility providers provide essential services that support business, residents and visitors. Investigations need to be undertaken by the relevant authorities to assess the structural integrity of their service infrastructure. The committee will seek to work with utility providers to review and update their contingency plans to include reference to landslides.

Interim Control Action

Liaise with utility providers to ensure that essential service providers have contingency plans that identify landslides as a hazard.

3. Stoney Creek Township Precinct

Stoney Creek runs through the township of Halls Gap. During the January 2011 floods the creek experienced extremely heavy flows of both speed and volumes of water. This led to the inundation of businesses in the Stoney Creek stores as well as erosion along the creek banks. Whilst immediate restoration works have been undertaken near the stores to stabilise the banks, it is unknown at this stage what impact the landslides in the upper and immediate catchment will have on future stream flows in Stoney Creek. This will need to be taken into account by emergency agencies when making decisions associated with community safety. The collision of debris, volume of water and erosion has impacted upon the stability of the Stoney Creek Bridge and the pedestrian footbridge remains closed. Further damage to this bridge will have a significant impact upon future evacuations of Halls Gap.

Interim Control Action
Liaise with VicRoads to assess bridge integrity as this is critical for access and egress, particularly in the event of another emergency situation.

4. Storm Damage
The weather event in January 2011 caused extensive stream flooding, overland flows of water, windblown debris and sediment flows. The combined effects from these storm driven issues caused varying degrees of impacts on private houses, businesses, community assets and public infrastructure.

Interim Control Action
Control and support agencies to respond and provide immediate assistance during emergency events.

5. Evacuation
In the event of a landslide or landslide threat, Victoria Police is the control agency and any decision to evacuate will be made by the Victoria Police Incident Controller. Victoria Police, with the assistance of relevant support agencies, is responsible for the evacuation process.

Interim Control Action
Emergency agencies to provide timely evacuation advice.

6. Business Continuity
The uncertainties around future landslides have an impact on land use, business, tourism, property values and community attitudes in the short term. Council will support Halls Gap business and communities to recover and grow from the flood and landslide events of January 2011.

Interim Control Action
Council to develop an Economic Recovery Sub-Committee to support business continuity.

7. Communication
A communications plan will need to be used in the event of an emergency to ensure residents, business owners and visitors are made aware of the event and clearly instructed as to what actions they should take.

Interim Control Action
Committee to prepare a communications plan.

8. SUMMARY OF INTERIM CONTROL ACTIONS

INTERIM CONTROL ACTION	STATUS	REVIEW DATE
1. Access and Egress	Completed	Coincide with opening of Dunkeld Rd
2. Utility Providers	Ongoing	January 2012
3. Stoney Creek Township Precinct	In progress	Coincide with opening of Dunkeld Rd
4. Storm Damage	Ongoing	Ongoing. To be discussed at Emergency Management meetings.
5. Evacuation	Ongoing	Ongoing. To be discussed at Emergency Management meetings.
6. Business Continuity	Committee established	December 2011
7. Communication	Communications Plan developed – refer to Appendix 2	December 2011

9. GLOSSARY OF TERMS

Annual Exceedance Probability (AEP): The estimated probability that an event of specified magnitude will be exceeded in any year. Usually expressed as a percentage (e.g. 1.0 % AEP)

Average Recurrence Interval (ARI): The average, or expected, value of the periods between exceedances of a given rainfall total accumulated over a given duration. It is implicit in this definition that the periods between exceedances are generally random. Usually expressed in a yearly interval (e.g. 1 in 100 year ARI)

Debris: A mixture of soil and coarser materials such as cobbles, rock and sometimes organic matter.

Debris Flow: A form of rapid landslide in which generally loose soil, rock and sometimes organic matter such as trees and vegetation combine to form a slurry that flows downslope.

- Debris flows are prevalent in steep gullies and can be intensified in gullies and steep slopes that have been denuded of vegetation due to bushfire or forest activities.
- Debris flows can travel extremely rapidly (of the order of 60 km/hr or more) depending on the gully consistency and slope angle.
- Debris flows are commonly caused by high surface flow due to intense heavy rainfall that erodes and mobilizes loose soil, rock and organic matter on steep slopes or within steep gullies. They are commonly very wet to fully saturated and contain large proportions of silt and sand sized particles.

Earth (soil): An aggregate of small solid particles generally of minerals or rock that was either transported or formed by the weathering of the rock in place.

9. GLOSSARY OF TERMS (continued)

Landslide: The movement of a mass of rock, debris or earth (soil) down a slope.

- Landslides are described through a combination of material type and the type of movement.
- The three basic material types are:
  - Rock
  - Debris
  - Earth or Soil
- The five basic movement types are:
  - Falls
  - Topples
  - Spreads
  - Slides
  - Flows
- Hence the combination of both the type of material and the type of movement involved gives a basic description of the landslide type e.g. rock fall, debris flow, earth slide.

Landslide Susceptibility: A quantitative or qualitative assessment of the classification, volume and spatial distribution of landslides which *exist* or *potentially may occur* in an area.

Likelihood: Used as a qualitative description of probability or frequency.

Rock: A hard mass comprised on minerals that is intact and in its natural place before the initiation of movement.

Appendix 1
RAINFALL THRESHOLD INDICATORS

The following rainfall threshold indicators are proposed to direct various emergency preparedness and response activities associated with potential debris flow activity in the Halls Gap township. The thresholds have been formulated following an assessment of historical rainfall records and documented accounts of similar landslide activity in the Halls Gap and broader Grampians region.

The rainfall thresholds introduce the concept of *rainfall intensity and duration* which has been shown to be very significant in the initiation of debris flows in this area. Communication and preparedness protocols are linked to a predicted or forecast 1 in 50 year annual recurrence interval (ARI) event derived from data sourced from the Bureau of Meteorology (BOM). Details for potential evacuation protocols are linked to a predicted or forecast 1 in 100 year ARI . Information has been provided in both chart and tabular format. Information on forecast events is to be sourced from the SES in conjunction with data from BOM.

Rainfall Threshold	***Response Status***	***Potential Landslide Consequence***	***Action***	***Who***
Forecast 1 in 50 year ARI	*Heightened awareness*	*Based on historical evidence some smaller scale landslide activity is possible but no debris flows are expected. Flooding is expected.*	***Communication***	
			Inform the township of forecast events and reinforce emergency preparedness protocols through ongoing communications.	*SES*
			Monitor and update as new information becomes available.	*SES*
			Preparation	
			Be prepared to act if unforeseen landside activity occurs	*VicPolice, NGSC VicRoads,, GWMW, Powercor, CMA, DHS, Red Cross, Residents, Visitors, Business, School and Community*
			MECC potentially placed on standby	*VicPolice, NGSC*
			Prepare traffic management plan	*VicPolice*
Forecast 1 In 100 year ARI	*Evacuation*	*Based on historical evidence, extensive landslide activity is expected. Debris flows transporting rock and boulder to areas are likely in susceptible areas[1]. Further areas of sand, silt and mud are also likely to extend even further downstream. . Extensive flooding. Water erosions and scour is almost certain in areas at the end of gullies and catchments.*	***Response***	
			Initiate protocols for evacuation based on those areas identified as susceptible to debris flow.	*VicPolice SES, NGSC, VicRoads, GWMW, Powercor, CMA, DHS, Red Cross*
			MECC notified.	*VicPolice*
			Participate in Emergency management agency meetings	*SES, VicPolice, NGSC, VicRoads GWMW, Powercor, CMA, DHS, Red Cross*
			MECC established	*NGSC*
			Prepare and implement traffic management plan	*VicPolice*
			Communication	
			Provide timely communication	*SES & VicPolice*
			Contact utility providers.	*SES & VicPolice*

Disclaimer
The information provided in the rainfall threshold matrix is based on limited information that is generalised. It does not take into account, slope, soil type, pre-site conditions such as soil saturation, vegetation cover etc. It should be noted that the situation can change rapidly and will not be consistent in each event. Instructions issued by Emergency Agencies should be followed carefully and expediently to minimize loss of life and injuries.

Footnote[1] *Refer to the Northern Grampians Shire Council website on www.ngshire.vic.gov.au for details of the landslide susceptible areas in Halls Gap.*

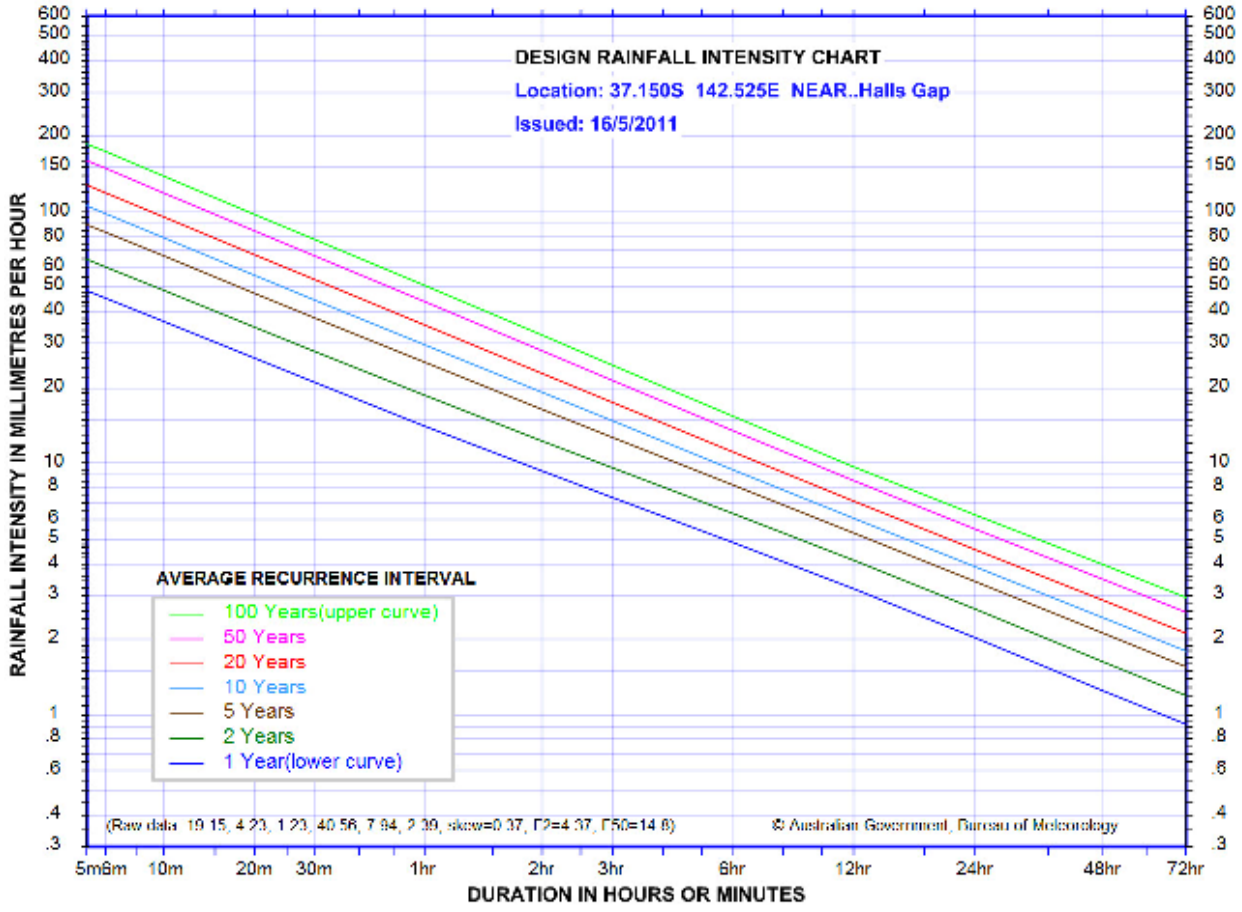
Appendix 1 (continued)
RAINFALL THRESHOLD INDICATORS

I in 50 year ARI event - Heightened Awareness Thresholds used for Communication and Preparedness

Duration	Rainfall Intensity mm/hr	Total rainfall in mm
30 mins	67.10	33.6
1 hr	44.10	44.1
2 hrs	28.10	56.2
3 hrs	21.40	64.2
6 hrs	13.50	81.0
12 hrs	8.55	102.6
18 hrs	6.50	117.0
24 hrs	5.49	131.8
48 hrs	3.47	166.6
72 hrs	2.57	185.0

I in 100 year ARI Event - Evacuation Thresholds use for Response and Communication

Duration	Rainfall Intensity mm/hr	Total rainfall in mm
30 mins	78.10	39.1
1 hr	51.1	51.1
2 hrs	32.30	64.6
3 hrs	24.50	73.5
6 hrs	15.30	91.8
12 hrs	9.62	115.4
18 hrs	7.50	135.0
24 hrs	6.15	147.6
48 hrs	3.89	186.7
72 hrs	2.88	207.4



Appendix 2

HALLS GAP LANDSLIDE INTERIM GUIDELINES – COMMUNICATIONS PLAN

There are two clear segments of communication that need to be considered in the preparation of the Halls Gap Landslide Interim Guidelines.

1. Communication OF the Guidelines

It is important for the committee to communicate to the public the process being undertaken in drafting and implementing the Halls Gap Landslide Interim Guidelines. It is suggested that a range of media be used to ensure the public is aware of the guidelines and is kept up-to-date as the process continues. These should be used as significant milestones are reached and/or as any major changes occur in the process and will be coordinated by the Northern Grampians Shire Council Marketing and Communications Officer/Flood Recovery Communications Officer.

- Media releases
- Copy on websites (NGSC)
- Copy in 'Fill the Gap' community newsletter
- Copy in Halls Gap PS newsletter
- E-mail to Halls Gap emergency event database
- Hard copy updates at the Halls Gap VIC

2. Communication WITHIN the Guidelines

A communications plan will need to be used in the event of an emergency to ensure residents, business owners and visitors are made aware of the event and clearly instructed as to what actions they should take.

Considering that a number of different agencies have a responsibility to communicate during an emergency event, it is important that communication **between** these agencies is frequent to ensure accurate and consistent communication **from** each one. Where an Incident Control Centre (ICC) has been established communication will be made with the ICC's Information Unit to ensure accurate consistent communication messages are delivered in a timely manner.

During the January 2011 events, an incident event database was established by Council with the aim of creating a wide-reaching list of those needing to be kept informed throughout the emergency event and in the recovery period following. To be added to this list, people can either contact the Council offices (5358 0503) or e-mail hgc@ngshire.vic.gov.au

Communication during an incident needs to make use of dynamic mediums which allow information to be provided and updated immediately. Past experience shows that the best tools to use include websites, social media (e.g facebook, twitter) and radio.

Appendix 2 (continued)
HALLS GAP LANDSLIDE INTERIM GUIDELINES – COMMUNICATIONS PLAN

Given the unpredictable nature of the possible future events, communications plans and key messages will need to be managed on a case-by-case basis. However, it is suggested that the information be disseminated using the following tools:

- Alerts on websites (NGSC, SES)
- Status updates on Council's facebook page
- E-mails to the incident event e-mail database
- Emergency announcements on local radio
- Emergency alerts as issued by the Incident Control Centre (ICC)

In order for this to be successful, residents and business owners should be informed through **part 1** of this communications plan to join the emergency event e-mail database and 'like' the Council facebook page to ensure the best possible saturation of the publics concerned.